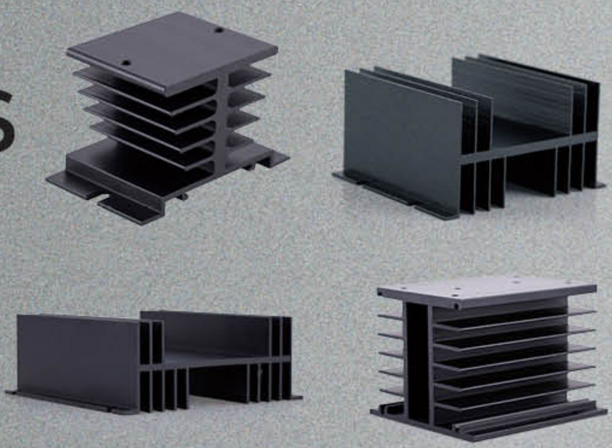
SSR Accessories

Heatsinks

HFS92B Series



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DESCRIPTION

SSRs will only achieve their promise of reliability and long life if they are kept cool. Normally it is suggested to keep the temperature of the SSR metal base at less than 85°C (185°F). Heatsinks can be an effective solution to ensure the proper operation and long term reliability of SSRs, because they provide a means to dissipate the power that is normally developed internally in the SSR into the surrounding ambient air and maintain a safe operating temperature. And it is very important to know how to select and use a heatsink for the reason that the heatsink directly affects the Max. load current and the Max. ambient temperature that the SSR can endure.

Heatsinks are made of high thermal conductive material such as aluminum. Usually the metal base of the SSR will be coated with some thermal grease or a thermal pad to enhance heat dissipation, and then the SSR will be firmly pressed against the heatsink for full adherence. For high-power SSRs the wind cooling should be required. Insufficient thermal dissipation may cause permanent damage to the SSR due to overheating.

We can use a simple thermal model to calculate the heat dissipation as follows:

$T_J - T_A = P \times R_{JA}$

In the above formula T_J stands for the junction temperature of the power parts of semiconductor(℃), T_A stands for the ambient temperature (℃), P stands for general power consumption (W) and R_{JA} stands for thermal resistance (℃/W) from junction to ambient. The thermal resistance of simplified SSR relays is made up of two parts as follow: $R_{JA}=R_{JC}+R_{CA}$. In the formula, R_{JC} stands for thermal resistance from junction to case and R_{CA} stands for the thermal resistance from case to ambient.

For example, when we calculate the heat dissipation of KS15/D-24Z25, R_{JC} of this relay is about 1.2℃/W, R_{CA} is about 8.5℃/W. The max. allowable junction temperature is 12°c and the power consumption is P=U x I. When the current is 10A or below 10A, the TRIAC voltage drop is about 1.1V. The formula of product without heat sink is show as follow, 125- T_A=1.1 X I X (1.2+8.5).

According to the above formula, the max. current is 9.3A at 25℃ ambient temperature and 6A at 60℃ ambient temperature when the product dose not add a heat sink.

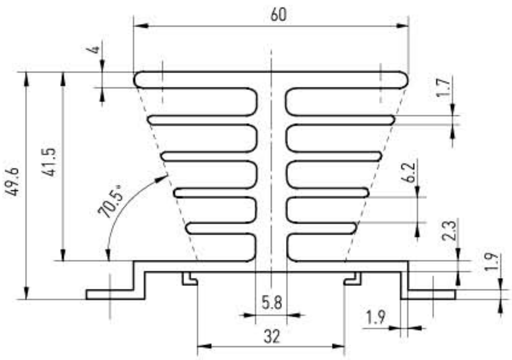
If we add HF92B-120 heat sink to this relay and the reference thermal resistance is about 1.1℃/W. Neglecting the thermal resistance from SSR metal base to heat sink, and the voltage drop is about 1.25V on full load current. The formula will be 125- T_A=1.5 X I X (1.2+1.1). Max. ambient temperature will be 40℃ when the operating current is 25A and the max. current will be 18A when the ambient temperature is 60℃. Due to the different heat sink types, the corresponding thermal resistance changes. So there are different current values under corresponding ambient temperature.

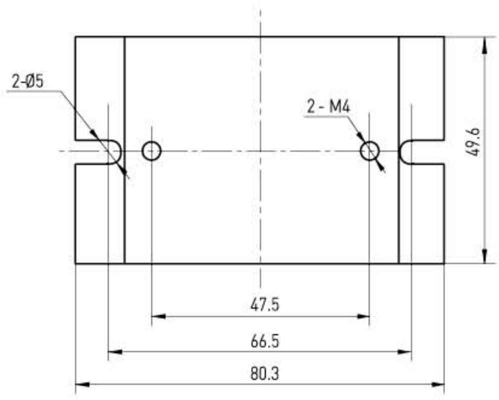
Part Number	Dimensions (mm)	Thermal Resistance	Matching SSR
HF92B-80	50x50x80	2.4℃ /W	**KS15:** 10A, 15A **KS33:** 30D50, 50D40, 200D10 **KS53:** 10A
HF92B-120	64x110x18	1.1℃ /W	**KS15:** 20A, 25A **KS33:** 400D10, 150D50, 100D20, 500D7, 500D12 **KS34:** 25A **KS53:** 15A, 20A
HF92B-150A	55x142x50	0.6°C /W	**KS15:** 40A **KS24:** 10A, 15A, 20A, 25A **KS28:** 25A **KS33:** 50D80, 100D40, 200D40, 30D100 **KS34:** 40A, 50A **KMRS:** 10A, 15A, 25A **KMRT-H:** 25A **KMRT:** 10A, 15A, 20A, 25A **KIS70:** 40A, 50A **KIS75:** 50A
HF92B-150C (Requiring an additional cooling fan)	80x100x110		**KS24:** 40A and above types **KS28:** 40Aand above types **KS33:** 100D80 **KS34:** 60Aand above types **KS64:** 10A, 15A, 20A **KMRS:** 40A **KMRT-H:** 50A **KMRT:** 40Aand above types **KIS70:** 60Aand above types **KIS75:** 60Aand above types

OUTLINE DIMENSIONS

Unit: mm

HF92B-80

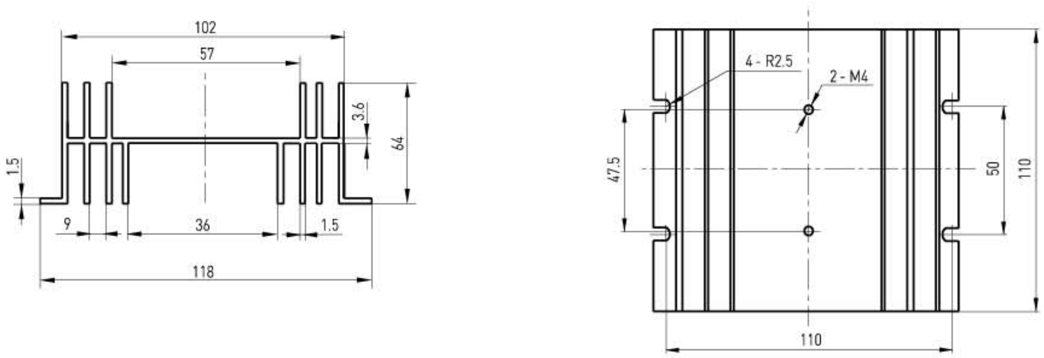




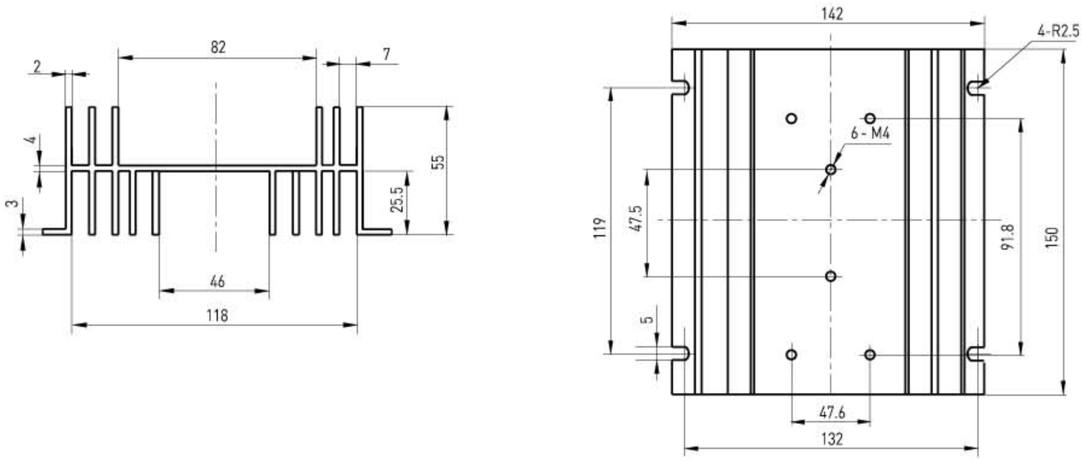
OUTLINE DIMENSIONS

Unit: mm

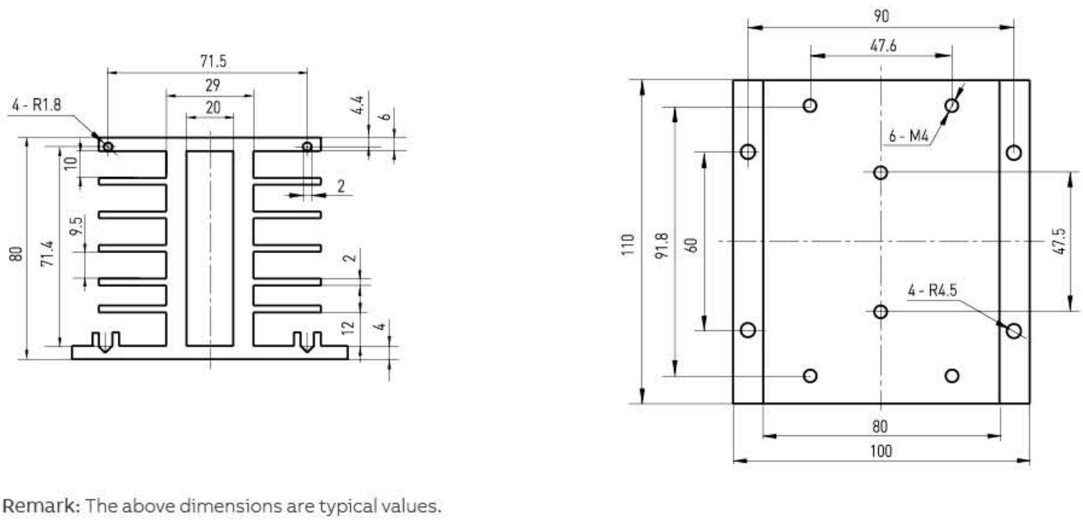
HF92B-120



HF92B-150A



HF92B-150C



Remark: The above dimensions are typical values.